U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-257 329

CONTROLLING INDUSTRIAL WATER POLLUTION -- PROGRESS AND PROBLEMS. (REPORT TO THE CONGRESS)

COMPTROLLER GENERAL OF THE UNITED STATES

DECEMBER 2, 1970

261128

PB 257 329

REPORT TO THE CONGRESS

Controlling Industrial Water Pollution-- Progress And Problems B-166506

Federal Water Quality Administration

Department of the Interior

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

DEC. 2,1970

BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No. PB-257 329
4. Title and Subtitle Controlling Industrial Water Pollution--Progress and Problems. (Report to the Congress).			5. Report Date December 2, 1970 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Comptroller General of the United States Washington, D. C.			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered 14.

15. Supplementary Notes
Prepared in cooperation with Federal Water Quality Administration, Washington, D. C.

16. Abstracts

The report presents the results of a review of the progress made and problems encountered by certain States and the Federal Water Quality Administration, Department of the Interior, in controlling industrial water pollution.

17. Key Words and Document Analysis. 17a. Descriptors

*Water pollution abatement
*Industries
Water pollution control
Reviews
Law(Jurisprudence)

17b. Identifiers/Open-Ended Terms

17c. COSATI Field Group 13B, 13H

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
National Technical Information Service Springfield, VA 22161	UNCLASSIFIED	76
	20. Security Class (This Page) UNCLASSIFIED	22. Price PC$5.00/ MF$2.25

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-166506

To the President of the Senate and the
Speaker of the House of Representatives

This report presents the results of our review of the progress made and problems encountered by certain States and the Federal Water Quality Administration, Department of the Interior, in controlling industrial water pollution.

Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget, and to the Secretary of the Interior.

Comptroller General
of the United States

Contents

		Page
DIGEST		1
CHAPTER		
1	INTRODUCTION	5
	Waste treatment processes	7
2	DIMENSIONS OF WATER POLLUTION	9
3	ILLUSTRATIONS OF PROGRESS	13
	Androscoggin River	13
	Savannah River	17
	Detroit River	20
4	PROBLEM AREAS IDENTIFIED	22
	State capability to control pollution	22
	Financing	22
	Staffing	24
	Monitoring	27
	Planning	30
	Waste inventory data	30
	Effects of pollutants	31
	Treatment requirements	33
	FWQA enforcement actions	37
	Legal authority	38
	Data on which to act	40
	Guidelines for action	41
5	CONCLUSIONS, RECOMMENDATIONS, AND MATTERS FOR CONSIDERATION BY THE CONGRESS	43
	Conclusions	43
	Recommendations	46
	Matters for consideration by the Congress	46
6	FEDERAL AND STATE COMMENTS AND OUR EVALUATIONS	48
	Council on Environmental Quality, Executive Office of the President	48
	Department of the Interior	48
	State water pollution control agencies	52

		Page
CHAPTER		
7	SCOPE OF REVIEW	56
APPENDIX		
I	Letter dated September 3, 1970, from the Council on Environmental Quality, Executive Office of the President, to the General Accounting Office	61
II	Letter dated September 29, 1970, from the Department of the Interior to the General Accounting Office	62
III	Letter dated August 7, 1970, from the Georgia State Water Quality Control Board to the General Accounting Office	65
IV	Letter dated September 3, 1970, from the Maine Environmental Improvement Commission to the General Accounting Office	67
V	Letter dated September 15, 1970, from the Michigan Department of Natural Resources to the General Accounting Office	68
VI	Letter dated August 18, 1970, from the Ohio Department of Health to the General Accounting Office	69
VII	Letter dated August 29, 1970, from the Washington Department of Ecology to the General Accounting Office	70
VIII	Principal officials of the Department of the Interior responsible for administration of the activities discussed in this report	72

ABBREVIATIONS

BOD	biochemical oxygen demand
FWQA	Federal Water Quality Administration
HEW	Department of Health, Education, and Welfare

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

CONTROLLING INDUSTRIAL WATER POLLUTION--
PROGRESS AND PROBLEMS
Federal Water Quality Administration
Department of the Interior B-166506

D I G E S T

WHY THE REVIEW WAS MADE

This is one of a series of General Accounting Office (GAO) reports on water pollution problems in the United States. Previous GAO reports on this subject dealt mainly with municipal sewage treatment plants, to which most Federal grant funds have been directed.

Industry, using billions of gallons of water daily in producing steel, paper, chemicals, petroleum, and other products, has for years dumped its wastes into the Nation's waters.

Because of (1) the increasing public concern and congressional interest in the gnawing problem of water pollution and (2) the significance of industry's contribution to the problem, GAO examined into the progress made and the problems encountered in reducing pollution caused by industrial waste discharges.

FINDINGS AND CONCLUSIONS

GAO's study of 14 waterways in five States--Georgia, Maine, Michigan, Ohio, and Washington--showed that some progress had been made in abating industrial water pollution. Industry, in many cases, has reduced substantially the amount of pollutants being dumped into the Nation's waters, but much more needs to be done.

State governments have primary responsibility for preventing and controlling water pollution. GAO found that the approach, the emphasis, and the achievements attained varied from State to State. In some States, prodding by the State government--together with public pressure--has spurred industry to action. Some industries are now spending millions of dollars for treatment facilities or are making process changes to solve their portions of the problem. In other States, few tangible results can be seen.

Where State agencies had limited funds and staff with which to attack water pollution problems, State agency personnel spent much time reviewing and approving plans for the construction of waste treatment plants but did not perform other important activities, such as plant visits and water quality monitoring. (See pp. 22 to 29.)

Effective planning--a key element--has been hampered by such problems as the lack of data on the types and extent of pollutants being dumped into the waterways by industry and the lack of knowledge of the effect of certain pollutants on the water. (See pp. 30 to 33.)

Another problem involves the manner in which treatment requirements are set. The five States included in GAO's review generally require polluters to provide secondary treatment (see p. 7 for definition) or its equivalent. The requirement for secondary treatment is due, at least in part, to encouragement from the Federal Water Quality Administration (Agency).

The Agency has proposed an amendment to the Federal regulations to require municipalities to provide, as a minimum, secondary treatment to qualify for Federal assistance.

Secondary treatment may not always be necessary to achieve desired water uses. A requirement for such treatment can result in additional capital expenditures and operating costs without increasing water uses. GAO believes that treatment requirements should be geared to meet water quality standards and that less than secondary treatment should be acceptable where such treatment is sufficient to meet water quality standards. (See pp. 33 to 36.)

Present enforcement action against a polluter must be based on a showing that its waste discharge reduces the quality of the water below established standards or endangers health and welfare, which may be difficult and costly.

Enforcement action is hampered by a lack of (1) information upon which to act, (2) authority to enforce specific effluent restrictions, and (3) authority to enforce dates set for implementing abatement measures without showing a violation of water quality standards or danger to health and welfare. In addition, the Agency's regional enforcement personnel appeared uncertain as to how the law should be enforced. (See pp. 37 to 42.)

RECOMMENDATIONS OR SUGGESTIONS

The Secretary of the Interior[1] should

--encourage the States to strengthen their staffs;

--develop, in cooperation with the States, an inventory of industrial sources of pollution;

---

[1]Effective December 2, 1970, the functions of the Agency are to be transferred to the Environmental Protection Agency. (See p. 5.)

--obtain data on trends in water quality and on progress being made by industry in meeting target dates for the construction of abatement facilities; and

--provide additional guidance to the Agency's regional personnel on enforcement procedures.

AGENCY ACTIONS AND UNRESOLVED ISSUES

In commenting on a draft of this report, the Council on Environmental Quality, Executive Office of the President, stated that:

> "We feel that the report is extremely worthwhile in addressing a problem area fundamental to our efforts to achieve meaningful levels of water quality."

The Department of the Interior and the State water pollution control agencies agreed, in general, with the report's findings. The Department indicated that a proposed amendment to the Federal law and some additional actions taken or planned by the Agency were in accord with three of GAO's recommendations. The Department disagreed with GAO's recommendation for providing additional guidance to regional personnel on enforcement procedures and with GAO's position on the secondary treatment requirement. Two of the five States disagreed with some of GAO's conclusions and recommendations.

The comments of the Federal and State agencies and GAO's evaluations thereof are discussed in chapter 6.

MATTERS FOR CONSIDERATION BY THE CONGRESS

Some of the proposals presently being considered by the Congress that deal with matters discussed in this report would provide for:

--Federal authority to establish and enforce specific effluent restrictions.

--Expansion of Federal jurisdiction to all navigable waters, both interstate and intrastate.

--Failure to meet implementation schedules being considered cause for enforcement action.

--National effluent charges (see p. 46) to apply to all substances, other than domestic sewage, that detract from the quality of the water.

--Additional grant funds to States for administering water pollution control programs. Factors to be considered in awarding the

additional grant funds include whether a State is providing adequate manpower and is instituting measures for recruiting and developing personnel.

GAO is recommending that the Congress consider the matters discussed in this report during its deliberations on such proposed legislation.

GAO is recommending also that the Congress consider whether applicants for Federal grants should be required by the Agency to provide secondary treatment even in those cases where less than secondary treatment would result in meeting water quality standards established by the States and approved by the Federal Government.

CHAPTER 1

INTRODUCTION

The General Accounting Office has studied the problems and progress associated with the fight against water pollution resulting from wastes being dumped by industry into the Nation's waters. The scope of the study is discussed on page 56.

Historically, the States have had the responsibility for preventing and controlling water pollution. Because of increasing concern over this problem, however, Federal laws have been enacted in recent years that increase the Federal role--mostly through grants, technical assistance, enforcement, and encouragement to the States--in abating water pollution.

Although the Federal Government authorized some experimental effort in water pollution control in 1948, permanent legislation did not come until 1956 with the passage of the Federal Water Pollution Control Act (33 U.S.C. 466). This act provided for Federal participation in a variety of activities, including cooperation with States in developing comprehensive programs, technical assistance, research, and grants to States to support administration of their programs and to construct municipal waste treatment plants. The 1956 act was strengthened, especially in the areas of enforcement, grants, and research, through an amendment in 1961.

The most significant legislation, however, was the Water Quality Act of 1965 (79 Stat. 903), which established what is now known as the Federal Water Quality Administration (FWQA) within the Department of Health, Education and Welfare (HEW). Responsibility under the act was transferred to the Secretary of the Interior in May 1966.[1] The act

---

[1] In accordance with Reorganization Plan No. 3 of 1970, the functions of the Secretary of the Interior relating to water pollution control are to be transferred to the Environmental Protection Agency, effective December 2, 1970.

required the establishment of water quality standards by the States to meet the Federal objective of providing water of adequate quality for such purposes as public water supply, propagation of fish and wild life, recreation, and agricultural and industrial uses. FWQA is responsible for achieving this objective through cooperative programs with State, interstate, and Federal agencies and with municipalities and industry.

More specifically, the 1965 act (1) authorized grants for research and development of better methods for controlling pollution caused by overflows from combined storm and sanitary sewers, (2) raised the dollar limitations on Federal grants for building municipal sewage treatment plants, and (3) authorized the setting of water quality standards for interstate waters. Regarding the last point, the States were given until June 30, 1967, to submit to the Secretary of the Interior for approval water quality criteria and plans for implementing and enforcing them, which together form the water quality standards. In the event that the States fail to establish such standards, the Secretary of the Interior can initiate action to establish Federal standards. By June 1969 the Secretary had approved, in whole or in part, the standards of all 50 States.

The Federal Water Pollution Control Act was further amended by the enactment of the Clean Water Restoration Act (Public Law 89-753) which expanded the scope of the research and development program established by the Water Quality Act of 1965. The act authorized grants for demonstration projects for the prevention of industrial pollution and new or improved methods of joint treatment of municipal and industrial wastes.

FWQA activities are directed by its headquarters staff located in Washington, D.C. Its field activities are carried out through nine regional offices which are generally responsible for planning, technical programs, pollution surveillance, enforcement, research and development, and construction grants. Some of the regions also have suboffices and laboratories for research and testing.

WASTE TREATMENT PROCESSES

The conventional waste treatment process is usually considered to consist of two steps--primary treatment and secondary treatment. Primary treatment involves (1) the removal of suspended and settleable solids by flotation and sedimentation and (2) chlorination of the effluent. Primary treatment plants normally reduce the biochemical oxygen demand (commonly referred to as BOD)[1] by about 35 percent, by removing about 50 percent of the suspended solids and about 90 percent of the settleable solids. When the flow of the receiving stream is high in relation to the quantity of sewage contributed, the primary treatment process is sometimes sufficient to safeguard public health and to prevent the development of nuisance conditions. Additional treatment is often required, however, especially when the flow of the receiving stream may be low or when pollution loads are exceptionally high.

Secondary treatment involves the aerobic decomposition[2] of the greater portion of the organic matter left in the effluent after the primary treatment process. The main function of secondary treatment, in general, is to furnish oxygen to support aerobic decomposition of the organic matter which cannot be removed by sedimentation. If properly operated and maintained, secondary treatment plants without high industrial waste concentrations normally will remove from 80 to 95 percent of the total BOD and approximately 85 percent of the suspended solids. The presence of industrial wastes can generally be expected to reduce these removals if the plant is not properly designed and if careful control is not continually maintained over the treatment process.

---

[1] BOD is a measure of the strength of sewage in terms of the amount of oxygen required to sustain decomposition of the waste by bacteria.

[2] Aerobic decomposition is the breakdown of organic matter in sewage by bacteria which grow in an aquatic environment containing dissolved oxygen.

Tertiary treatment involves a set of chemical and physical processes beyond those of primary and secondary treatment. Although tertiary treatment processes remove substantially all the BOD and suspended solids, the processes are used mainly for the removal of specific substances, such as phosphates.

- - - -

The principal officials of the Department of the Interior responsible for administration of the activities discussed in this report are listed in appendix VIII.

CHAPTER 2

DIMENSIONS OF WATER POLLUTION

The misuse of the Nation's water has resulted in rivers that burn and water that does not freeze. Continued pollution, regardless of the source, means less and less water of suitable quality. At the same time, the continuing growth of population and industry means an ever-increasing demand for clean, usable water. We have an affluent society. With affluence comes the demand for more and better products, which results in increased industrial output. But increased industrial output frequently means increased pollution.

Although sometimes referred to as prophets of doom, some scientists and biologists have warned that, if we do not stop poisoning our environment, we risk self-extermination. The following examples of warnings are taken from the Congressional Record.

> "*** continued pollution of the earth, if unchecked, will eventually destroy the fitness of this planet as a place for human life."
> Barry Commoner, biologist, Washington University, St. Louis, Missouri.

> "If the fish are dying, the people are not far behind." Dr. Paul B. Cornely, president, American Public Health Association.

Cities and factories are the major sources of water pollution. FWQA reports that the number of communities having sewer systems is just under 13,000 and that about 68 percent of the Nation's population lives in such communities. Raw or inadequately treated sewage from millions of people still flows into our streams. Each year 1,000 communities outgrow their treatment facilities, which results in even more raw or inadequately treated sewage. In other cases, facilities are poorly managed--with similar consequences.

The National Association of Manufacturers reported that industry uses over 30 billion gallons of water daily, excluding water used for power generation. The steel industry, the largest user, withdraws over 10 billion gallons of water every day. A steel company located on the Cuyahoga River in Ohio discharges daily about 290 million gallons of water into the river that enter Lake Erie in a very short time. It takes 10,000 gallons of water to produce each automobile. About 10 gallons of water were required to produce the paper in this report.

The Bureau of the Census reported that 8,925 manufacturing plants in the United States accounted for about 97 percent of all industrial water use. FWQA reported that there were over 300,000 water-using factories in the United States.

In addition to pollution by municipal and industrial sources, a number of other sources contribute to the gradual destruction of our water. These include overflows from combined sanitary and storm sewers, pesticides and related agricultural runoffs, and oil spills. Moreover, many factors and interrelationships affect each waterway and complicate the problem, as illustrated below.

--In Ohio, although companies and municipalities along the Maumee River are being required to install costly pollution control devices, a State official has told us that, even if all these facilities are installed, water quality still will not be satisfactory. Reason: the Maumee River meanders for many miles through farmland, and the constant erosion and pesticides and other chemicals from agricultural runoffs create water quality problems.

--Various State officials have told us they do not always know what interaction takes place when several different chemicals or poisonous substances are dumped together into a river. In setting treatment requirements, one State, Michigan, compensated for this lack of knowledge by taking the known toxic level for individual substances and reducing it by 90 percent, but still no one knows for sure whether this overcompensates or undercompensates for the problem.

--Sometimes materials dumped into the water resurface, to the consternation of future generations. An unusual phenomenon exists at Manistique, Michigan, where a beach is packed with sawdust from 18 inches to 2 feet thick. The sawdust started drifting in about 12 years ago. Apparently the sawdust was dumped into the river by sawmills which operated along the Manistique River from about 1875 to 1910.

--Water pollution, air pollution, and solids disposal are sometimes closely related. To combat air pollution, a plant may install scrubbers which use water to remove particles from smoke. The particles must then be removed from the water before it is discharged into the waterway. After the particles are removed from the water, a means of disposing of them must be found.

--The Cuyahoga and Rouge Rivers have been set afire by the ignition of floating oil. A Cuyahoga River fire nearly destroyed two railroad bridges before it was contained. The Monongahela River contains so much acid from mine drainage that it remains unfrozen even in the coldest winters.

Technical advances have made it possible to install facilities or to make process changes that substantially reduce or eliminate the damaging discharges from industrial plants. But the real problem is how to apply this technology at a reasonable cost and still remain competitive in the marketplace. Industries' expenditures for pollution control are either passed on to the consumer through higher prices or taken from profits. Some plants are restricted by a lack of space for building treatment facilities; others are old and the construction of costly facilities may make it unprofitable to continue operations.

The cost of success in controlling water pollution will be substantial. FWQA has estimated, for example, that the cost of constructing facilities applicable to both municipalities and industry for fiscal years 1970-74 will be $20 billion to $23 billion. Construction costs could increase substantially. FWQA's estimates are shown below.

	Estimated construction costs (billions)
Municipal waste treatment	$10.0
Collection-sewer construction	6.2
Industrial waste treatment	2.2 to 4.4
Industrial cooling	1.9
Total	$20.3 to 22.5

The above figures do not include estimated operation and maintenance costs of between $5.3 and $5.7 billion.

Further illustrations showing the substantial cost to industry follow.

--The petroleum industry's capital expenditures for water pollution control were estimated at $338 million for 1966 through 1968. The related operation and maintenance costs were about $158 million for the same period.

--In December 1968 a steel company announced that it planned to spend $18 million to abate pollution from its plants on the Cuyahoga River.

--In 1970 a paper company on Puget Sound in Washington, after extensive negotiations with the State, agreed to install treatment facilities over a period of several years. The State advised us that the company's estimated cost would be $52.7 million.

CHAPTER 3

ILLUSTRATIONS OF PROGRESS

The demand for clean water has resulted in State and Federal action to require industry to clean up. Progress has been made. Industry, in many cases, has reduced substantially the amount of pollutants being dumped into the Nation's waters, but much more needs to be done.

Our review included 14 waterways in five States. We were unable to determine whether the overall quality of the waterways had improved, but in many cases we were able to determine that individual plants had reduced pollution, which should result in improved quality. The following illustrations of the actions taken on three rivers show varying stages of progress. On one river most of the action taken had been limited to planning, on the second river some reductions in industrial pollution had been obtained and more were planned, and on the third river the industrial pollution had been significantly reduced.

ANDROSCOGGIN RIVER

The Androscoggin River, one of America's 10 most polluted rivers, flows about 174 miles through New Hampshire and Maine. In 1964 industries on the Androscoggin were using 122 million gallons of water a day, whereas municipalities were using 3 million gallons a day.

During the 1940's obnoxious river odors resulted in court decrees which provided for the reduction of pollution and the appointment of an administrator to correct the conditions causing the stench. Three paper companies were cited as being responsible for the odors. At the urging of the administrator, the three companies corrected the odor problem by converting to a different pulp production process and thereby reduced the amount of BOD wastes entering the river.

Because of continuing pollution problems, however, an enforcement conference for the Androscoggin River was held in 1962 and 1963 by the Secretary of HEW. Subsequent meetings of HEW, Maine, and New Hampshire officials resulted in

the adoption of a water pollution abatement program for the river.

The major polluter on this river, a paper company located in New Hampshire, was discharging about 120,000 pounds of BOD daily. This company agreed to discharge its wastes into a municipal waste treatment system, provided that (1) at least 90 percent of the funds necessary to build the system was contributed by the State and Federal Governments, (2) a reasonable time was allowed for building the system, and (3) the charge to the company for using the system was reasonable.

Maine officials determined that a 70-percent reduction in BOD would bring the river quality to the desired level. In 1966 the four major sources of pollution to the river in Maine were identified as follows:

	Pounds of BOD (daily)
Company A	98,300
" B	49,600
" C	9,600
" D	8,800
Total	166,300

The Maine Legislature, in 1967, adopted a time schedule for building waste treatment facilities for abating water pollution on the river.

Action	Date
Preliminary plans	Oct. 1969
Final plans	" 1972
Begin construction	" 1973
Complete construction	" 1976

Maine officials, under the law, have the authority to accelerate the dates. A meeting for this purpose was held in March 1969. Industry opposed any speedup of the compliance dates because money was not available. As of September 1970 the dates had not been accelerated.

Following is a discussion of what is being done in Maine to abate the major sources of industrial pollution on the Androscoggin.

--Company A, a paper and pulp mill, has long been a major source of pollution of the river. During the 1940's the mill was involved in curing the river odor problem. The mill converted its pulping operation to a different process, but the reduction in pollution was somewhat offset by an increase in the mill's production capacity. The papermaking operation was also expanded between 1960 and 1966. The company has requested that its waste be handled by a nearby municipality.

Under the legislature's abatement schedule, preliminary plans have been submitted that call for separate plants to be constructed by the municipality--one for its wastes and a second for the mill's waste. The plans show that the treatment plant for the mill's waste will cost $6 million. The company is on record as being ready to proceed with its abatement program as soon as State and Federal money totaling $5.1 million is forthcoming to build the plant.

--Company B has two mills on the river, one producing paper and the other producing paper and pulp. The paper mill submitted its preliminary plans which call for joint treatment with a nearby municipality. The paper and pulp mill, a relatively new mill, was required by the State prior to beginning operations to:

--provide adequate primary treatment,

--maintain flow records, and

--take samples of waste and provide them to the State.

In January 1969 the State found that the mill was discharging nearly five times the BOD load reported in a 1966 Maine river study report. Preliminary plans submitted in September 1969 proposed construction of a 27-acre lagoon with a 31-million-gallon capacity.

--Company C, a building materials manufacturer, submitted preliminary plans to the State in October 1969 calling for in-plant process changes and primary treatment. The company also agreed to provide secondary treatment if needed.

--Company D, a pulp and paper mill, submitted preliminary plans in October 1969 showing four alternative methods for treating its waste. No decision had been made on what method would be pursued, although joint treatment with a municipality had been discarded as being too costly.

SAVANNAH RIVER

The Savannah River is one of the principal interstate rivers in the Southeast. Formed by two other rivers, it serves as the boundary between Georgia and South Carolina for 310 miles before discharging into the Atlantic Ocean at Savannah, Georgia.

In 1965 the lower 28 miles of the river were the subject of a Federal enforcement conference[1] which resulted in the following recommendations.

--Industry should remove 90 percent of the oil and settleable and floating solids it discharges.

--Industry should remove 25 percent of the BOD it discharges.

--Studies should be made to ascertain the biological, physical, and chemical characteristics of the river and of the waste being discharged, to determine what additional treatment is necessary.

Georgia adopted water quality standards for the river in 1967. The use classifications for various sections of the river range from drinking water to navigation. In 1969 the enforcement conference was reconvened and the recommended BOD removal rate was raised from 25 to 85 percent. This recommended removal rate was to be met by the end of 1972.

Because of the large number of industrial plants on the river, we limited our review to 13 companies identified as major polluters by Georgia officials. Nine of the 13 companies are located in the enforcement conference area.

Following is a discussion of the progress made by some of the companies in the conference area. These companies

---

[1]The enforcement conference is the first stage of enforcement proceedings under the Federal law. (See p. 37 for a discussion of Federal enforcement authority.)

are to meet the requirements outlined in the conference recommendations,[1] including the requirement to upgrade treatment to remove 85 percent of the BOD load.

--Company A, a chemical company, was discharging 690,000 pounds of sulfuric acid daily in 1963. In 1967 Georgia required removal of 25 percent of the BOD, 90 percent of the solids, and removal of toxic and other detrimental wastes. To meet the State requirements, the company enlarged its settling basin to increase waste retention time, installed equipment to provide greater mixing of the acid, and installed metering devices to measure acidity. Due to a lack of data, we were unable to determine the reduction in waste material being discharged.

--Company B, a large pulp mill, was discharging 87,000 pounds of solids and 135,000 pounds of BOD daily in 1966. The company instituted internal process changes and installed equipment to reduce the solids, oxygen-demanding material, and oil. Reports submitted by the company showed that, for 3 months in late 1969, the waste discharged contained 10,000 pounds of solids and 119,000 pounds of BOD daily (reductions of 89 and 12 percent, respectively, from 1966).

--Company C, another pulp mill, was discharging 22,000 pounds of BOD daily in 1963. A 1969 survey by the State showed, after equipment was installed, a 36-percent reduction in the plant's BOD (22,000 to 14,000 pounds daily). The survey showed also that 49 percent of the solids were being removed.

--Company D, a food-processing plant, was discharging 6,700 pounds of solids and 4,000 pounds of BOD daily in 1967. After a program to improve internal processes was initiated, the company was surveyed again in 1969. The 1969 survey showed discharges of

---

[1]Conference recommendations are agreements reached between Federal and State officials as to the corrective measures that should be taken as a result of the conference findings.

700 pounds of solids and of 2,200 pounds of BOD daily (reductions of 90 and 45 percent, respectively, from 1967).

The treatment requirements imposed on companies included in the enforcement conference were not carried over to the nonconference companies by Georgia officials. Treatment requirements for the four nonconference plants included in our review were established on an individual-plant basis by the State. Examples follow.

--In 1967 company , a textile company, was required by the State to reduce its BOD discharge by 3,000 pounds daily, an 87 percent reduction. To comply with the requirement, the company provided a new retention basin and equipment. A 1969 survey by the company's engineering consultant showed a removal efficiency of 87 percent. A later survey by the State also showed that the plant was operating satisfactorily.

--In 1965 company F, a paper company, generated wastes containing 42,000 pounds of BOD daily. The company increased production and also agreed to handle wastes from another plant. The State limited the discharge of BOD to 20,000 pounds daily. Operating reports submitted by the plant from August 1968 through November 1969 indicated a BOD load of 18,000 pounds daily--a reduction of 57 percent from 1965.

DETROIT RIVER

The life of Lake Erie depends on the quality of water coming from the Detroit River. The 32-mile river contributes 93 percent of the lake's water, is an avenue for shipping and recreational boating, and serves as the source of domestic water supply for many of the people in southeast Michigan. It is one of the fastest flowing rivers in the country--an average flow of 180,000 cubic feet a second.

In 1962, at the request of the Governor of Michigan, an enforcement conference was called. During discussions at this conference, it became apparent that more information on the river was needed, and the conferees initiated an intensive study of the river and its waste sources.

After 3 years, the conference was reconvened (June 1965), and the conferees agreed, among other things, on the following points.

--Inadequately treated municipal and industrial discharges into the Detroit River was creating pollution.

--A time schedule for abatement of pollution would be established.

--All industries would regularly provide an analysis of their wastes to the State.

In November 1966 the State of Michigan advised FWQA that all industries and municipalities cited by the conference for contributing to water pollution had executed formal agreements to meet both the time schedules and effluent restrictions established by the State. In June 1967 industry was discharging 606 million gallons of water daily and municipalities were discharging 743 million gallons of water daily into the Detroit River.

Water quality standards were established in 1967. The lower half of the river was classified as an industrial water supply and the upper half as a domestic water supply. The entire river was classified for use for recreational boating and fishing.

For the pollution problems of the river, identified at the conference, significant corrective action had been taken by nearly all polluters by September 1969. Examples of reductions in wastes reported by companies are discussed below.

--Company A, a steel company, discharged 2,200 pounds of iron into the river daily for the 16 months prior to May 1968. By installing treatment facilities, the company reduced the discharge of iron to 86 pounds a day--a 96-percent reduction.

--Company B, a chemical plant, discharged an average of 77,100 pounds of chlorides daily before installing treatment facilities. After the facilities were in operation, the average discharge dropped to 3,200 pounds daily--a 96-percent reduction.

--Company C, another chemical plant, decreased the amount of phosphate in its daily discharge from an average of 14,400 pounds to an average of 4,800 pounds (a 67-percent reduction) after installing treatment facilities. Further reductions are required by the State.

A Michigan official told us in March 1970 that the Detroit River was in the best shape it had been in for 25 years.

CHAPTER 4

PROBLEM AREAS IDENTIFIED

We believe that, although progress has been made in reducing industrial water pollution and plans indicate that this effort will continue, there are a number of roadblocks to a systematic and timely cleanup of our waterways. Some State agencies included in our review had only limited funds and limited staff to attack pollution at its source. Effective planning, a key element in this massive campaign, has been hampered by such problems as the lack of data on the types and extent of pollutants being dumped by industry and the lack of knowledge of the effect of pollutants on the water.

Other problems require solution. Consideration must be given to how treatment requirements are to be established. Also we believe that FWQA's enforcement authority should be clarified and strengthened to enable FWQA to take vigorous actions when States fail to act against polluters. These and related problems are discussed below.

STATE CAPABILITY TO CONTROL POLLUTION

As the States have the primary responsibility for water pollution control, they must have the tools, including money and people, to do the job. In the five States included in our review, we found wide variances in the amount of money and people provided for State pollution control agencies, as well as in the States' approaches to monitoring waste discharges and water quality. The States' financing, staffing, and monitoring activities are discussed below.

Financing

The amount of money a State agency has at its disposal governs, to a large extent, the scope and adequacy of its program. With insufficient funds, a State will normally have insufficient staff. In the five States which we visited, we found wide variances in the level of financing the water pollution control program because of differences in pollution problems within each State, the affluence and size

of the State, other programs competing for available State funds, and the attitude of the States toward pollution control.

FWQA provides grants to States to assist in paying the costs of administering their programs. In addition to a $12,000 basic grant to each State, FWQA allocates its available funds to the States on the basis of population, per capita income, and the number of industries using water (wet industries). The source of funds and total financing for fiscal year 1970 for the five States included in our review are shown below.

State	State funds		Federal funds		Total
	Amount	Percent	Amount	Percent	
Georgia	$ 380,900	63	$220,400	37	$ 610,300
Maine	336,600	84	63,400	16	400,000
Michigan	1,211,500	74	414,800	26	1,626,300
Ohio	553,300	55	445,000	45	998,300
Washington	1,089,600	89	129,400	11	1,219,000

There are substantial variations between the percent of Federal and State contributions for the five States. Washington, with an abundant supply of good-quality water, contributed a substantially higher percent than did Ohio where the water supply is limited and often polluted. Also Ohio has a much larger population and several times as many wet industries than Washington. Of the five States, Maine has the smallest population and the fewest wet industries--yet the percent of Maine's contribution to the total cost of administering the program was greater than those of Georgia, Michigan, and Ohio.

Over the past 5 years, the appropriations by the five States for their water pollution control agencies have increased substantially, as follows:

	Fiscal year appropriations					Percent increase from 1966 to 1970
	1966	1967	1968	1969	1970	
	(000 omitted)					
Georgia	$ 75	$113	$227	$309	$ 381	408
Maine	177	179	206	215	337	90
Michigan	-	595	735	864	1,212	104[a]
Ohio (note b)	382	417	457	463	553	45
Washington	220	342	607	774	1,090	395

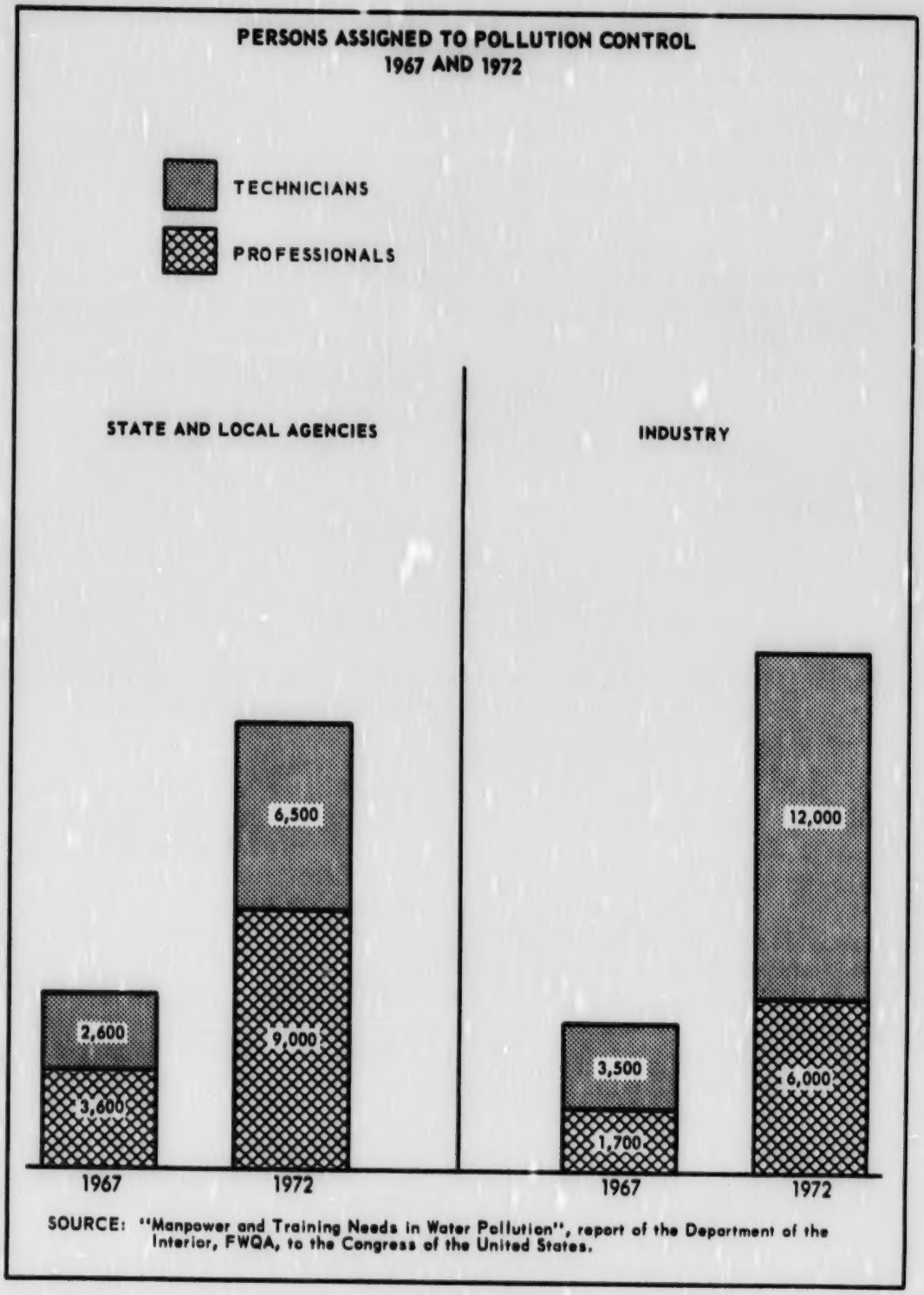
[a]Increase from 1967.

[b]Amounts shown for Ohio for fiscal years 1966-69 are expenditures.

Staffing

Because of insufficient staff, some State water pollution control agencies have been forced to limit their activities. In some States, personnel spent much of their time reviewing and approving plans to construct waste treatment facilities while other important activities, such as plant visits, water quality monitoring, and industrial waste inventories compilations were not done. To get the job done, an adequate staff is essential.

In 1967 FWQA reported to the Congress that thousands of professional and technical personnel were already involved in the nationwide fight against water pollution. Moreover FWQA believed that the number should increase significantly by 1972, as shown by the following graph.



SOURCE: "Manpower and Training Needs in Water Pollution", report of the Department of the Interior, FWQA, to the Congress of the United States.

In 1964 the Public Administration Service, a private organization, made a study for HEW, to determine appropriate staffing levels for each State water pollution control agency. This study considered such factors as the extent of pollution, industrialization, urbanization, and water use. We compared staff levels in the five States to those recommended in the study and found that the States generally had less than the levels recommended; one had only 23 percent of the recommended minimum. The staffs recommended in the 1964 study and the actual staff levels for fiscal year 1969 are shown below.

State	Recommended		Actual Fiscal year 1969
	Minimum	Desirable	
Georgia	43	76	38
Maine	32	46	18
Michigan	110	171	108
Ohio	137	209	31
Washington	39	70	72

Since 1964 the workload of the State water pollution control agencies has increased, and the above-recommended staff levels are probably too low.

Our review showed that there was a relationship between a staff's size and its activities. For example, we found that Washington's staff was at the desirable level and was able to handle the paper work and perform other necessary activities. The staff made 1,770 inspections of municipal and industrial waste treatment facilities in fiscal years 1968 and 1969 and planned to make 4,500 inspections in fiscal years 1970 and 1971. Michigan, with a staff level above minimum, also was able to handle the paper work, make regular monitoring visits to plants, and make detailed studies of some river basins.

The Ohio staff, well below the minimum level, reviewed permits and construction plans and made stream surveys but made very few plant visits. Maine's staff was also well below the minimum level. It had data on the volume and characteristics of discharge, but in some instances the data was several years old. A State official told us that, because

of a lack of personnel, there was little follow-up with industries to determine whether violations of discharge licenses were occurring.

Several State officials said that they could use more staff. One official said that the State was unable to obtain more staff because it could not pay adequate salaries. FWQA reported to the Congress in 1967 that there was convincing evidence that the high vacancy rates in positions in some State agencies were due to noncompetitive salaries.

In fiscal year 1969 Ohio had a staff of 31. An Ohio official told us that the State substantially raised salaries in fiscal year 1970 and as a result was able to employ 19 new people.

A proposed amendment to the Federal Water Pollution Control Act would offer additional administrative grants to State and interstate agencies. The amendment would progressively increase these grants from $10 million to $30 million for improved water pollution control programs over a 5-year period. Elements which would be considered in awarding additional funds include the States' provisions for training and developing personnel to adequately implement State programs and for recruiting personnel.

Monitoring

To know what is necessary for abating and controlling water pollution, State personnel must know the dimensions of the problem. They must know water quality trends, who the polluters are, and the progress being made by the polluters in correcting problems. This is done by testing water quality, making plant inspections and surveys, testing plant effluents, and requiring periodic operating reports by polluters. Consistent with the wide variances we found in financing and staffing, we found also wide variances in the monitoring procedures in the States we reviewed. In some States the monitoring was rather limited.

Georgia obtains data on water quality through a program started in fiscal year 1968. Under this program, Georgia has entered into agreements with the U.S. Geological Survey, the Corps of Engineers, FWQA, and various counties and

municipalities to collect samples, perform field analyses, and submit the samples and results to the State. Georgia then performs a laboratory analysis and makes the results available to those interested. As of December 1969, the Georgia program involved periodic grab samples at 227 locations plus data obtained from nine automatic monitoring locations.

The Georgia staff also makes visits to industrial waste treatment facilities to evaluate progress of construction, to perform efficiency evaluations, and to determine whether the facilities are being used. We were advised that visits had been limited because of inadequate staffing. During fiscal year 1969, Georgia evaluated the operating efficiency of 17 industrial waste treatment facilities. Several major industrial polluters have been submitting monthly operating reports. Georgia plans to require such reports from each polluter as more State staff becomes available.

Maine, with a limited staff, reported to FWQA that three industrial plants were inspected during fiscal year 1969 and that operating reports were not received from industry. Automatic monitoring was limited, but Maine officials believed that monitoring was unnecessary since most industries had not constructed water pollution abatement facilities. The State reported that, during fiscal year 1968, it collected 164 industrial effluent samples and 569 surface water samples.

Michigan has a policy of visiting each plant at least once a year and, where a problem exists, State officials may make additional visits. The State reported to FWQA that about 600 industrial plants were inspected during fiscal year 1969 and that plant operating reports were submitted by over 100 companies. The State staff also makes 1- to 2-day waste surveys at plants and makes visual inspections of the Detroit and Rouge Rivers by helicopter and by boat.

Ohio officials told us that they did not have a program for the regular testing of industrial waste effluents and that, in fact, the amount of testing had decreased from prior years. They told us also that, although they recognized the need for plant visits, the staff did not make enough visits because of other demands on their time. The

water quality data being received from the U.S. Geological Survey under contract with Ohio and from independent contractors, municipalities, and industries is not being analyzed regularly to show whether there is a reduction or increase in water pollution. Some companies which have waste treatment facilities are not submitting effluent reports to the State agency on a regular basis, and some of the reports that are submitted do not contain adequate information concerning waste characteristics.

Washington's monitoring program consists of taking water quality and effluent samples, making plant inspections, and requiring the submission of operating reports by industry. During fiscal year 1969, 3,900 samples were collected and analyzed from 240 stations established to monitor the quality of water. In-plant surveys, ranging in duration from 1 day to 1 week, were also made to determine effluent characteristics and plant operating efficiency. In addition, special water quality studies were made when problems were known. During fiscal years 1968 and 1969, 1,770 inspections of domestic and industrial treatment facilities were made and 25 grab samples were taken from treatment facility outfalls. The State received operating reports from 58 companies considered to be the major polluters.

PLANNING

The Nation's quest for clean water demands a comprehensive, well-planned attack on pollution at its source. Before launching such an attack, the planner needs to (1) identify the types and extent of wastes by major polluters on each waterway, (2) know the effects of various pollutants on the water, and (3) establish treatment requirements to meet water quality standards. Problems in each of these areas are discussed below.

Waste inventory data

The Federal Water Pollution Control Act requires FWQA to prepare or develop comprehensive programs for eliminating and reducing pollution, taking into consideration the discharge of municipal and industrial wastes or substances which adversely affect the quality of the water. To develop such programs, data on the source, type, and amount of pollution is essential.

This data is rather limited at the Federal level and exists in varying degrees of currentness and completeness in the five States we reviewed.

For many years FWQA has had a national municipal waste inventory which is periodically updated. A national industrial waste inventory is not available, although FWQA has been attempting to develop such an inventory since 1964.

A discussion of industrial waste data available at the five States we reviewed is presented below.

Georgia did not have a comprehensive waste inventory for industrial plants, although data on the nature and quantities of waste discharged by major polluters was available. The State agency attempted to prepare a Statewide inventory in 1967 but was unable to complete the project because of manpower shortages.

In Maine, industrial waste data was available in correspondence files, but some data was more than 5 years old. State officials expressed the belief that the information

would be updated when industries submit their preliminary plans for abatement of their pollution.

Michigan maintained files for each industrial polluter. The files contained reports submitted by the industrial plants and the results of tests made by the State. An Ohio official advised us that the State did not have an industrial waste inventory but that data on all major polluters was in its files.

Washington maintained an extensive inventory of polluters. It included a listing of industries discharging directly into State waters, detailed waste discharge data on over 1,000 companies, and an analysis of the amount and nature of the waste. The director of the Washington Water Pollution Control Commission told us that he considered industrial waste data to be very important in carrying out the industrial waste discharge permit program.

Effects of pollutants

On each of the 14 waterways, the industrial plants included in our review had installed, or planned to install, facilities to reduce or eliminate the pollutants entering the waterways. In many cases, however, the actions were being taken without knowledge of whether the pollution problem would be corrected, that is, whether the desired water use[1] levels would be achieved.

For many years, pollution control experts have known the effects of organic wastes--wastes from municipal sewage systems, paper and pulp mills, and food-processing plants--and what is needed to reduce or eliminate them. This information enables planners to better determine what facilities are needed to improve water quality.

Unfortunately, the numerous inorganic and toxic wastes which come from steel, petroleum, chemical, and similar

---

[1] Desired water use refers to the purposes for which the waterway has been designated, such as boating, fishing, or industrial water supply.

industries present a more difficult challenge. Such wastes include iron, oil, chlorides, copper, mercury, nickel, acids, and cyanide.

The Detroit and Rouge Rivers in Michigan have many large plants lining their banks. The numerous inorganic, toxic, and organic materials that are dumped affect not only the rivers but also Lake Erie. A Michigan official told us that the State had used professional judgment in setting treatment requirements for industry, because it was attempting primarily to correct the problem on Lake Erie. He added, however, that the State did not always know exactly how much material could be dumped without injury to the lake. Therefore the State has taken the known toxic level and reduced it by 90 percent, which, it believed, was an adequate safety margin.

At times toxic materials can be dumped without detection. For example, in early 1970 it was learned that one of the chemical plants on the Detroit River had been dumping mercury into the river for some time, apparently without the knowledge of FWQA and of Michigan which had previously made extensive tests.

Ohio generally requires secondary treatment, or its equivalent, on its rivers. Secondary treatment is not applicable to many industrial wastes because they are inorganic or toxic. For such wastes, State engineers negotiate with the polluting companies and set restrictions on how much can be dumped. These restrictions are apparently based on the engineers' judgment.

Officials of three States said that problems existed because of the lack of knowledge about the materials being dumped. Some officials said that they were not sure what was a safe level of discharge for some materials. Others said they did not know the reaction when more than one chemical was dumped into the water.

It is possible to require the installation of facilities for the treatment of industrial and municipal waste and still not obtain the desired water quality because of pollution from other sources. For example, the Maumee River

meanders through many miles of Ohio and Indiana farmland. Industries and municipalities are being required to install treatment facilities, but an Ohio official told us that this effort would not raise the water quality to the desired level because the primary pollutant of the river was the runoff from farmlands.

FWQA officials have advised us that the installation of treatment facilities alone will not raise the water quality at all places because of other pollutants, such as agricultural runoff. They have expressed the belief, however, that present abatement facilities will result in marked improvement.

In attempting to find solutions to the problems, FWQA has directed a sizable portion of its research and development money toward finding out what happens to pollutants after they are dumped into the water. During fiscal year 1968 it awarded 117 research grants and contracts totaling $3.8 million for water quality research, of which 39, totaling $1.4 million, were directed toward determining the effect of various pollutants.

Treatment requirements

How much should an industry or municipality be allowed to pollute? Should there be a minimum level of treatment of wastes which no one may go below, regardless of the assimilative capacity of the water? If so, what should this minimum level be--primary, secondary, or tertiary?

These are nagging questions facing pollution officials throughout the country. A system which provides for a minimum level of primary treatment with additional treatment, if necessary, based on the assimilative capacity of the waterway would require an investment in only those treatment facilities needed to meet desired water uses.

Federal regulations state that, to qualify for FWQA financial assistance for municipal sewage treatment construction grants, the proposed facilities must, at least, provide primary treatment of wastes. Although an associate solicitor of the Department of the Interior stated in

July 1969 that a blanket secondary treatment requirement could not be imposed, FWQA has encouraged the States to establish a minimum requirement of secondary treatment or its equivalent. Further, in September 1969 FWQA notified 95 administrators of water pollution control programs throughout the country that it intended to amend the Federal regulations to require secondary treatment with a minimum removal of 85-percent BOD for applicants to qualify for FWQA assistance. In December 1969 the Acting Associate Solicitor, Water Resources and Procurement, Department of the Interior, stated that:

> "In our opinion, the Secretary has authority to require minimum levels of treatment as a condition for the award of construction grants."

In June 1970 the Department of the Interior proposed a change in the Code of Federal Regulations that required that no grant be made unless the applicant assured the Secretary that the facility would provide secondary treatment with a minimum BOD removal of 85 percent. The Commissioner of FWQA may waive this assurance in the case of municipalities having population equivalents of 10,000 persons or less or where discharge is into the ocean through ocean outfalls.

Each of the five States included in our review has a general policy of requiring polluters to install secondary treatment or its equivalent due, at least in part, to FWQA's encouragement. Several methods were employed by the States in establishing water uses and related criteria.[1] In one State, proposed uses and criteria were established as goals and treatment requirements were set with a view to later restudying the waters to see whether additional treatment was needed. Another State determined the use possible if all industrial plants and municipalities were to install secondary treatment facilities. Still another State required a minimum of secondary treatment with the stream uses

---

[1] Criteria are the specific limitations, such as fecal coliform count and temperature, necessary to safely utilize a waterway for its intended purpose, such as recreation or agricultural uses.

and related criteria to be established only at the insistance of FWQA.

For some waterways considerable data was available on existing water quality when the uses and criteria were established, for others little or no data was available. This lack of data on water quality, coupled with the lack of specific data on the polluters, casts some doubt on whether the treatment requirements set will result in increased water uses.

Most States also had adopted some form of restriction on the quantity of each pollutant that could be discharged. The method of setting these restrictions varied from State to State and sometimes within a State. A State may have specific quantitative restrictions such as limiting a plant's discharge to so many pounds of BOD a day or so many particles of pollution per million gallons of water discharged. A restriction may also be in general terms, such as requiring that the toxicity level not interfere with possible water uses.

The effluent restrictions established may be based on the assimilative capacity of the waterway or may relate to some uniform rate of removal of waste. For example, a State studied a waterway to determine the amount of dissolved oxygen present and how much could be discharged and still maintain a certain level of dissolved oxygen. The State determined that the waterway could assimilate a BOD load of 5,850 pounds daily during the summer low-flow season. The municipalities were then allocated a portion of this total permissible BOD load on the basis of projected future populations. Thus municipality A would be limited to discharging up to 4,000 pounds a day while municipality B would be limited to 810 pounds a day. During the remaining months when the streamflow and resulting assimilative capacity was increased, a portion of the additional assimilative capacity would be allocated to industry and the remainder would be held as reserve. FWQA officials felt that it was not possible to make such precise determinations because of the many variables involved.

In contrast, on another waterway in another State all municipalities and industries in an enforcement conference

area are being required to remove at least 85 percent of the BOD load from their waste water, regardless of the assimilative capacity of the waterway.

Secondary treatment may not always be necessary to achieve desired water uses. A requirement for such treatment can result in additional capital expenditures and operating costs without increasing water uses. In some situations secondary treatment facilities may be insufficient to achieve increased water uses, since even better facilities may be required or other sources of pollution--such as agricultural runoff--must also be controlled to achieve desired quality.

In his February 1970 message to the Congress on the environment, the President of the United States called for establishing precise effluent requirements based on a fair allocation of the total capacity of a waterway to absorb users' wastes without becoming polluted. We believe that one advantage of specific effluent restrictions could be quicker and easier enforcement actions against polluters. FWQA enforcement actions are discussed below.

FWQA ENFORCEMENT ACTIONS

FWQA gives financial and technical assistance to the States to combat industrial water pollution and normally does not get directly involved with polluters unless the States fail to take action. Enforcement action can then be taken against polluters. We believe that FWQA's enforcement authority needs to be clarified and strengthened, more data is needed upon which to act, and more guidance should be furnished by FWQA to regional personnel.

FWQA's original authority to take enforcement action was provided in the Federal Water Pollution Control Act of 1956. Such action, undertaken when pollution endangers the health and welfare of any persons, involves three steps: (1) a conference to identify polluters and to decide on corrective action, (2) a hearing involving a specific polluter not following the agreed-upon correction plan, and (3) Federal court action, as a final resort, against a polluter not making reasonable efforts at abating pollution.

Over a 14-year period, 50 enforcement conferences have been held involving 42 States, the District of Columbia, over 1,300 municipalities, and 1,700 companies. By June 1970 FWQA had held four hearings and had taken one court action.

The Water Quality Act of 1965 gave FWQA another enforcement tool. Under this act, the Secretary of the Interior can act to abate pollution where the discharge of matter into interstate waters or portions of such waters reduces the quality of such waters below the established State water quality standards. The Secretary can start enforcement action 180 days after having notified the violators and interested parties of the violation. The 180-day notice is issued to give the parties time to agree to take action voluntarily to meet the water quality standards.

By June 1970 the Secretary had issued eleven 180-day notices, including eight against industrial polluters. Six polluters have taken, or have agreed to take, corrective action. The other five have only recently been notified of violations.

Although the Federal enforcement actions to date have served as an important stimulus toward abating pollution, we believe that certain factors limit more vigorous Federal action. These factors are summarized below and are discussed in greater detail in the following pages. Enforcement is limited by:

--The lack of authority to enforce specific effluent restrictions. Under present law, violation of water quality or endangerment to health and welfare must be shown. This showing may be difficult and costly.

--The need to prove a violation of water quality standards, a reduction of water quality below the standards, and a pollution effect on health and welfare when attempting to enforce implementation dates.

--The lack of authority to move against all polluters on a waterway. Under present law FWQA can move only when pollutants cross a State boundary; when the Governor consents, in writing, in cases of intrastate pollution; or when substantial economic injury results from the inability to market shellfish.

--The lack of data on which to act. Data is incomplete as to progress in meeting implementation schedules and trends in water quality.

--The lack of guidance on enforcement procedures. FWQA regional personnel appear uncertain as to what constitutes grounds for enforcement action.

Legal authority

Under the law, FWQA can take enforcement action when (1) pollution is endangering the health and welfare of any persons or (2) the pollutants discharged reduce the water quality below standards. Action will be taken, therefore, after water pollution is already a problem--a problem which will not be overcome until needed facilities are built.

We believe that the use of specific effluent restrictions would permit setting treatment requirements for municipalities and industry before pollution becomes a

problem. Under such a system, enforcement actions would also be easier. Showing that there is a failure to meet the established restrictions, rather than show that the polluter's discharge is a violation of the water quality, would constitute sufficient grounds to act.

At present it may be difficult to show impairment of water quality because tests must be made over an extended period to show water quality trends. Even then it is difficult to relate a change in water quality to a specific municipal or industrial discharge. Consequently, as illustrated in the following example, a polluter may delay putting in facilities by claiming that its discharge is not lowering the water quality.

--As a result of a 1962 Federal enforcement conference, the State of Washington and FWQA made a joint study of Puget Sound. The State told us that the primary purpose of the study was to establish a valid toxicity level to protect aquatic life from sulfite waste liquors from pulp and paper mills. The study took 4 years and cost about $1.5 million. The State and FWQA maintained that the results were scientifically valid, but the companies still questioned the validity of the level established and, as of August 1970, had not constructed the treatment facilities requested by the State.

It is uncertain whether a polluter can be taken to court solely because it fails to meet an interim date.[1] The law states that action may be taken when pollution endangers health and welfare or when the discharge lowers the water quality below the standards.

To clarify this question, FWQA requested a legal opinion. In August 1969 an Associate Solicitor of the Department of the Interior held that the Secretary of the Interior

---

[1] Interim dates are the various dates applicable to the construction of treatment facilities, such as dates for submission of preliminary plans and for commencement of construction. (See p. 14.)

could enforce implementation schedules if he was able to show (1) a violation of water quality standards, (2) a reduction of water quality below the standards, and (3) a pollution effect on health and welfare. Also the Secretary can move unilaterally against a polluter only if the pollution affects another State; otherwise the Governor's consent is necessary for Federal enforcement action. Thus many polluters would not be subject to Federal enforcement action unless the State consented to such action.

FWQA's legal basis for enforcement actions under the 1965 act has not been tested in court, and FWQA acknowledges that the law is difficult to enforce. In his February 1970 message to the Congress on the environment, the President said that the present approach to water quality standards provided a poor basis for enforcement, since, with no effluent standards by which to measure, it was difficult to prove in court that water quality standards were being violated.

Data on which to act

For an effective Federal enforcement program, data on the progress of polluters in abating pollution is necessary. Early in 1970 data available was insufficient to show recent trends in water quality at the State level. At the Federal level, FWQA had not developed its program to a point which would permit observations on widespread trends of increases or decreases of the water quality of our Nation's waterways.

Monitoring of progress at the Federal level is generally limited to determining progress being made in the construction of treatment facilities. This monitoring is done by FWQA during its review of (1) semiannual progress schedules on enforcement conference recommendations and (2) progress reports on water quality standards implementation schedules. We found that such data was incomplete and that visits were seldom made by FWQA to verify the data furnished by States.

As of September 1970, 49 States had submitted progress reports on water quality standards implementation schedules

to FWQA. However, 7 States had not submitted any data (location, waste constituents, and so forth) on industrial polluters, 11 States had not shown any interim dates, and 30 States had not always shown interim dates.

An FWQA Southeast Regional Office enforcement official told us that in many instances it is difficult to measure progress because of the lack of established interim dates. Also the water quality implementation schedule data submitted by the States in the region was lacking in detail, and FWQA personnel had to update the data from any data that might be readily obtainable. Data for progress reports is based primarily on discussions with the States. FWQA personnel do not make routine visits to industry to obtain firsthand knowledge of progress. In June 1970 officials of the Southeast Region advised us that visits had been increased.

A Northwest Regional Office enforcement official told us that he obtained data on water quality abatement schedules and enforcement conference schedules from data submitted with State annual program plans and from discussions with State personnel. Visits to industries are seldom made.

Guidelines for action

FWQA has not issued guidelines on enforcement for the use of its personnel. We believe that, because of the magnitude of the pollution problem, such guidelines are essential to ensure a common understanding of the enforcement authority and consistent and timely action against polluters.

Northeast regional officials told us that FWQA headquarters had not given them formal guidance but that they had been told that it was basic policy that implementation schedules be enforced. A regional official told us that he believed that a violation of a water quality classification or the failure to meet an abatement schedule date did not, of itself, permit Federal enforcement action. He said that he believed that the water quality standards were not enforceable unless the pollution was endangering the health or welfare of persons in another State or unless the consent of

the Governor was obtained when the pollution endangered the health or welfare of persons in the State in which the pollution originated.

A Great Lakes regional enforcement official told us that the enforcement section of the current law was unclear and was subject to various interpretations.

A Northwest regional official told us that either the law should be clarified or written guidelines or instructions should be provided by FWQA headquarters to show what actions can be taken when water quality criteria are violated, when implementation plans are not complied with, and when both situations occur.

Our review of reports submitted by the Northwest Region to FWQA headquarters on progress on enforcement conference recommendations showed that considerable delays had occurred. We did not find any evidence, however, that additional Federal action, such as a hearing, had been initiated against any of the polluters. A regional official acknowledged that hearings had not been held in the region because FWQA could not legally start court action in such cases unless requested to do so by the Governor. An FWQA headquarters official, however, stated that Federal enforcement action could be taken against the companies but that such action had not been taken because State officials claimed that they were proceeding against these companies.

CHAPTER 5

CONCLUSIONS, RECOMMENDATIONS, AND MATTERS FOR CONSIDERATION BY THE CONGRESS

CONCLUSIONS

The concerted attack on water pollution that began in the 1960's has shown promising results, but, in relation to the magnitude of the problem, more must be done.

Our review of 14 waterways in five States showed that progress had been made in abating industrial water pollution. The lack of data, however, precluded a determination as to whether there had been an improvement in water quality. We noted reductions in pollution and noted plans for the construction of facilities which, when completed, should result in improvements in water quality.

States have the principal responsibility for pollution control. We found that the approach, emphasis, and success in counteracting the pollution problem varied from State to State.

The level of State funding is a significant factor which affects the adequacy of a State's water pollution control staff. The level of the staff influences the activities which the State water pollution control agency can undertake and adequately perform. The effectiveness with which the State carries out its activities bears on the success of its efforts to curb water pollution.

In the five States we visited, there were wide variances in the level of financing of the State pollution control agencies. Some State water pollution control agencies had only limited funds and insufficient staff to attack water pollution problems. As a result, although routine administrative functions are performed, other important activities, such as plant visits and water quality monitoring, either are not performed or are performed on a limited basis.

In mounting an intelligent attack on water pollution, comprehensive and well-directed planning is needed. To formulate such planning, information is needed on the sources of pollution, including volume and characteristics of waste discharged. Planners must know the effects that various pollutants or combinations of pollutants have on a waterway to prepare an adequate pollution abatement program. In addition, consideration must be given to the level of treatment that will be required--whether all polluters should be required to provide the same degree of treatment or whether requirements should be varied on the basis of such factors as the assimilative capacity of the stream.

Data on the sources of industrial pollution exists in varying degrees of currentness and completeness at the State level. Similar data is rather limited at the Federal level, although FWQA has been attempting for years to establish an inventory of such sources.

Pollution control experts have known for many years the pollution effects of organic wastes from municipal sewage systems, paper and pulp mills, and food-processing plants. Less is known about the possible effects of the numerous inorganic and toxic wastes being dumped into the Nation's waterways or about what happens when a number of these waste constituents are combined. Mercury was not considered to be a serious environmental hazard until recently.

The method of setting treatment requirements varies from State to State and sometimes within a State. In some cases each polluter may be assigned a different limit, in other cases all the polluters in the area are being required to remove at least 85 percent of the BOD.

FWQA has proposed an amendment to its regulations that would require all grant recipients to provide, as a minimum, secondary treatment with 85-percent BOD removal. We believe, however, that a requirement by the Federal Government for a minimum level of primary treatment plus chlorination and additional treatment if necessary, based on consideration of applicable water quality criteria and the assimilative capacity of the waterway, would require an

investment in only those treatment facilities needed to achieve desired water uses. The States, however, should have the option of establishing more stringent minimum requirements.

For any effective enforcement program, certain information is essential. The regulatory bodies must have a means of monitoring progress being made in the construction of abatement facilities and monitoring the trends in the quality of waterways. Personnel must fully understand what constitutes grounds for enforcement action.

At present there is a lack of information upon which to act. Insufficient information exists on trends in water quality at both the Federal and the State levels. As of the time of our review, not all States had submitted information to FWQA on the progress being made to meet abatement schedules. In many instances, information submitted showed only scheduled completion dates and did not show interim dates. FWQA regional enforcement personnel appear uncertain as to how the present law should be enforced.

Enforcement activities are influenced by the legal tools available. Under existing law, FWQA can take enforcement action only when pollution has occurred, that is, when the discharge has lowered the quality of the water or has endangered health and welfare. Even in attempting to enforce water quality implementation dates, FWQA must show endangerment of health and welfare and a reduction in water quality, which can be a lengthy and costly process. With testing, it may still be difficult to relate a change in water quality to a specific municipal or industrial discharge.

Specific effluent restrictions would simplify enforcement actions and could serve as a preventive measure in that the restriction could be set and enforced before pollution becomes a problem.

RECOMMENDATIONS

We recommend that the Secretary of the Interior

--encourage the States to strengthen their staffs;

--develop, in cooperation with the States, an inventory of industrial sources of pollution;

--obtain data on trends in water quality and on progress being made by industry in meeting target dates for the construction of abatement facilities; and

--provide additional guidance to FWQA regional personnel on enforcement procedures.

MATTERS FOR CONSIDERATION BY THE CONGRESS

Some of the proposals presently being considered by the Congress that deal with matters discussed in this report would provide for:

--Federal authority to establish and enforce specific effluent restrictions.

--Expansion of Federal jurisdiction to all navigable waters, both interstate and intrastate.

--Failure to meet implementation schedules being considered cause for enforcement action.

--National effluent charges[1] to apply to all substances, other than domestic sewage, that detract from the quality of the water.

---

[1]Effluent charges would be levied, on a national basis, as a form of rent for the use of water for disposing of industrial wastes. Each polluter would be assessed on the basis of the quantity of the waste discharged and on its relative strength and toxicity.

--Additional grant funds to States for administering water pollution control programs. Factors to be considered in awarding additional grant funds include whether a State is providing adequate manpower to implement its program and is instituting measures for recruiting and developing personnel.

We recommend that the Congress consider the matters discussed in this report during its deliberations on such proposed legislation.

As previously stated, FWQA has proposed an amendment to the Federal regulations that would require all applicants for Federal assistance in the cost of constructing waste treatment facilities to provide secondary treatment with a minimum BOD removal of 85 percent. We recommend also that the Congress consider whether applicants for Federal grants should be required by FWQA to provide secondary treatment even in those cases where less than secondary treatment would result in meeting water quality standards established by the States and approved by the Federal Government.

CHAPTER 6

FEDERAL AND STATE COMMENTS AND OUR EVALUATIONS

On July 31, 1970, drafts of this report were submitted to the Council on Environmental Quality, the Department of the Interior, and the State water pollution control agencies of the five States included in our review. The recipients agreed, in general, with our findings. The Department of the Interior and two of the States disagreed with some of our conclusions and recommendations. The comments of the Council on Environmental Quality, the Department of the Interior, the States, and our evaluations thereof are discussed below.

COUNCIL ON ENVIRONMENTAL QUALITY EXECUTIVE OFFICE OF THE PRESIDENT

By letter dated September 3, 1970 (see app. I), the Council on Environmental Quality, Executive Office of the President, stated that:

> "We feel that the report is extremely worthwhile in addressing a problem area fundamental to our efforts to achieve meaningful levels of water quality."

DEPARTMENT OF THE INTERIOR

By letter dated September 29, 1970 (see app. II), the Department of the Interior stated that:

> "The Department of the Interior has reviewed with interest your draft report entitled, 'Industrial Water Pollution--Progress and Problems, Federal Water Quality Administration, Department of the Interior.' The report concludes correctly that maintaining high quality in the Nation's water resources is the basic objective of pollution control and that there is insufficient data collection and interpretation at present to

properly evaluate existing pollution control measures on this basis."

Regarding our first three recommendations, the Department expressed the belief that the proposed amendments to the Water Pollution Control Act being considered by the Congress, coupled with additional agency actions, such as plans to initiate an industrial waste inventory in fiscal year 1971, were aimed at obtaining improvements in these areas.

Regarding our fourth recommendation, the Department stated that guidance was being provided to regional personnel through regular contact by the FWQA headquarters staff, wide distribution of transcripts of enforcement proceedings, regional participation in and conduct of enforcement proceedings, and required submission of a checklist to accompany regional recommendations for the initiation of enforcement proceedings. As pointed out on page 41, formal guidelines on enforcement have not been issued and regional personnel we contacted appeared uncertain as to what constituted grounds for enforcement action. Although we recognize that oral communication between FWQA headquarters and field personnel and the other actions mentioned by the Department can be beneficial, we believe that more definitive guidance is needed.

The Department took issue with our position regarding treatment requirements and stated that:

"Again we must take issue with the General Accounting Office recommendation to Congress in support of less than secondary waste treatment. The key element in the State/Federal nationwide program to abate existing pollution and prevent pollution where it has not already occurred is the requirement for the 'best practicable treatment' which is usually defined as a minimum of secondary treatment."

In support of its position, the Department stated:

--that water quality standards goals were based on more immediate needs but that waste treatment plants were designed to meet 20 years projected requirements.

The uncertainty of demands 20 years from now dictates that the projects be designed for the best treatment possible.

--that poor plant construction in the past had resulted in communities' outgrowing their facilities and contributing to a backlog of waste treatment facilities.

--that the assimilative capacity of the waterway formula was not an exact science and that making water more perfect depended upon the amount of waste kept out of it.

In a prior report to the Congress entitled "Examination into the Effectiveness of the Construction Grant Program for Abating, Controlling, and Preventing Water Pollution" (B-166506, November 3, 1969), we stated that the FWQA requirement of secondary treatment might be desirable as the ultimate objective. We stated also that, in view of the (1) magnitude of the problem and (2) substantial savings that could be realized in annual operation and maintenance costs, consideration should be given, to providing, as an interim measure, less than secondary treatment when such treatment would result in attaining the water quality required by the States' standards.

The Water Quality Act of 1965 required the States to adopt water quality criteria applicable to interstate waters and a plan for implementation and enforcement of the plan. In May 1966 FWQA issued guidelines for establishing such standards which stated that:

"*** no standard will be approved which does not require all wastes, prior to discharge into any interstate water, to receive the best practicable treatment or control unless it can be demonstrated that a lesser degree of treatment or control will provide for water quality enhancement commensurate with proposed present and future water uses." (Underscoring supplied.)

Our position is in complete agreement with these guidelines.

We believe that it is incumbent on the industry or municipality seeking to provide less than secondary treatment to document that the lesser degree of treatment "will provide for water quality enhancement commensurate with proposed present and future water uses." We believe also that any industry or municipality which is allowed to provide less than secondary treatment should be advised that, if circumstances change as a result of population growth and/or industrial expansion, it may be required to upgrade its treatment facilities.

STATE WATER POLLUTION CONTROL AGENCIES

The comments from Georgia, Maine, Michigan, Ohio, and Washington are presented in appendixes III through VII, respectively.

The Georgia State Water Quality Board stated that "we feel you have done a very good job on the report and commend you for its thoroughness." The board felt that we should emphasize the efficiency and economy that would result from avoiding duplication of effort by State and Federal agencies. The operational aspects of water pollution control, such as review of plans, enforcement, monitoring, and surveillance of streams, should be the primary responsibility of the States. The Federal effort should be directed toward problem areas having nationwide applicability, such as conducting research and development on toxic elements and compounds, determining and locating what industries use mercury, providing guidelines on mercury discharges, and developing specifications and new methods of waste treatment.

The Maine Environmental Improvement Commission stated that the report did not comment on several factors "having to do with federal action, applicable to municipalities but reflecting directly upon industry as well." These factors include the lack of Federal funding, the continual changing of the Federal act that encouraged communities to hold back on constructing treatment facilities in anticipation of a more advantageous program, and the fact that many communities were holding back because of the 85-percent BOD requirement.

The State of Maine does not appear to feel that it is necessary to continually monitor waterways. We believe that a continual, well-developed water quality monitoring system is needed to provide data for possible enforcement actions, observe trends in the lowering of water quality before it becomes a serious problem, and alert authorities to unobserved and possibly dangerous spillages.

The Michigan Department of Natural Resources advised us that its review of the report showed the data relating to Michigan to be factual.

The Ohio Department of Health stated that, in general, it had found "the Ohio portion of the report to be factual and to the point. You are to be commended for it." The Department expressed the opinion that the cost figures given on page 12 were "at least 50 percent low." It added that, although it recognized that reliable figures were not available, the use of partial figures could be very misleading.

The Washington State Department of Ecology stated that the information in the report appeared technically correct but that many of the conclusions and recommendations did not appear justified or the most logical on the basis of the data presented in the report.

The Department stated that (1) the general tone of the report was that the Federal Government should be stepping into the enforcement picture and taking the primary responsibility away from the States, (2) the report did not discuss what could be done at the Federal level to assist the States in their enforcement activities, and (3) the report did not discuss the States' activities in the enforcement area or what the States need to do a better job of enforcement. The Department stated also that it had substantially increased its enforcement activities over the preceding 18 months and that it believed that it was in a very good position with respect to capabilities, planning, and enforcement activities.

We have stated that the States have the primary responsibility for preventing and controlling water pollution. It should be recognized, however, that FWQA has responsibilities which include the area of enforcement under certain circumstances. We do not suggest that the Federal Government usurp State enforcement responsibility. Rather, we view Federal enforcement authority as a backup measure to be used when requested by the States or when States fail to adequately protect the health and welfare of the public. In this context, we have pointed out weaknesses in the Federal legislation for consideration by the Congress.

The primary purpose of our review was to examine into the problems and progress related to water pollution caused by industry. It was not our purpose to make an in-depth review of States' activities in the enforcement area or to

examine into what could be done at the Federal level to assist the States in their enforcement activities. We have recently initiated a review, however, of State and Federal enforcement activities, and these matters will be considered in that review.

The Department of Ecology stated also that:

> "A second item of concern to this agency is the position GAO has taken that only that degree of treatment is necessary which will maintain a receiving water at the level of purity defined by the standards. Our state statutes, adopted in 1945, requires [sic] that all dischargers are to provide all known available and reasonable methods of waste treatment before discharge to a state waterway. Secondly, the water quality standards, adopted by this state and approved by the Secretary of the Interior, contain a 'nondegredation' clause which simply states that the existing water quality, if higher than that of the standards, will be the governing quality and is not to be allowed to be lessened below the existing levels of purity. Your recommended approach of requiring the minimum degree of treatment commensurate with the standards is not in agreement with this state's philosophy."

We have not taken the position that "only that degree of treatment is necessary which will maintain a receiving water at the level of purity defined by the standards." Rather, our position regarding the level of treatment to be provided relates to what the Federal Government should require. We believe that the Federal Government should require that applicants for Federal grants provide the degree of treatment that will meet the States' standards. We do not question a State's requirement for a greater degree of treatment than that required by the Federal Government.

The Department stated further that:

> "Finally, the report states that GAO recommends the adoption of effluent standards because, among other things, effluent standards are easier to

enforce. The authority to set effluent standards within this state has been clearly defined by legislative action. This agency has been writing effluent requirements into its waste discharge permits for the past fifteen years. For this reason, we do not feel it is necessary to adopt effluent standards on a broad scale since we are able to apply them in each individual case. From the data presented in the report, it does not seem justified to recommend national effluent standards."

We did not recommend the adoption of effluent standards. Rather, we (1) concluded that specific effluent restrictions could simplify enforcement actions and (2) pointed out that the Congress was considering a proposal that would provide for national effluent charges to apply to all substances, other than domestic sewage, which detract from the quality of the water. We commend the State of Washington for its foresight in legislating for authority to set effluent standards. That State, however, is atypical in that neither the Federal Government nor most of the other States have such authority. Therefore we believe that the adoption of national effluent standards should be considered.

CHAPTER 7

SCOPE OF REVIEW

Our review was made to examine into the problems and progress being made in the fight against water pollution caused by wastes being dumped into the Nation's waters by industry. The following five States and 14 waterways were included in the review:

State	Waterway
Georgia	Savannah River
Maine	Androscoggin River Kennebec River
Michigan	Detroit River Rouge River St. Joseph River Saginaw River and Bay
Ohio	Ashtabula River Cuyahoga River Mahoning River Maumee River Miami River
Washington	Everett Study Area, Puget Sound Gray Harbor Area, Pacific Coast

We visited FWQA headquarters in Washington, D.C., and FWQA regional offices in Boston, Massachusetts; Atlanta, Georgia; Chicago, Illinois; and Portland, Oregon. The review covered activities during the period October 1965 to March 1970.

We reviewed legislation and examined records at FWQA headquarters and regional offices and at State offices. We interviewed FWQA headquarters and regional officials, State water pollution control agency personnel, and representatives from four trade associations and six corporations.

APPENDIXES

Preceding page blank

APPENDIX I

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
722 JACKSON PLACE, N. W.
WASHINGTON, D. C.

3 SEP 1970

Dear Mr. Voss:

We appreciate your sharing with us the proposed report to Congress on the progress and problems in controlling industrial pollution, enclosed in your letter to Chairman Train dated July 31, 1970.

We feel that the report is extremely worthwhile in addressing a problem area fundamental to our efforts to achieve meaningful levels of water quality. Dr. Winter of our staff discussed our comments in detail with Messrs. Brian Crowley and Ed Densmore of your office on September 1st.

Thank you for the opportunity to comment on your report. We look forward to continued future cooperation in our joint efforts to improve the quality of our environment.

Sincerely yours,

Alvin L. Alm
Senior Staff Member
for Environmental Control

Mr. Allen R. Voss
Associate Director
U.S. General Accounting Office
Washington, D.C. 20548

Preceding page blank

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

SEP 29 1970

Mr. Allen R. Voss
Associate Director, Civil Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. [illegible]:

The Department of the Interior has reviewed with interest your draft report entitled, "Industrial Water Pollution--Progress and Problems, Federal Water Quality Administration, Department of the Interior." The report concludes correctly that maintaining high quality in the Nation's water resources is the basic objective of pollution control and that there is insufficient data collection and interpretation at present to properly evaluate existing pollution control measures on this basis.

In response to the specific recommendations, the following information is supplied:

"Encourage the States to further develop their water pollution programs by strengthening their staffs."

As noted in the draft report, the Department has proposed an amendment to the FWPC Act which would provide additional funds to the States for purposes which include increasing their staff and training the staff. The amendment would progressively increase grants from $10 mm to $30 mm over a five-year period.

"Develop, in cooperation with the States, an inventory of industrial sources of pollution."

The Federal Water Quality Administration plans to initiate an industrial waste inventory in FY 1971. This inventory will be conducted in full cooperation and coordination with any similar activities in which the States may be engaged. The inventory will form the base for an automated industrial waste facilities program which, with its updating procedures, is designed to provide very current information to the industrial implementation plans. This information will also support basin planning, construction grants activities and the necessary cost of clean water reports. It will, in addition, provide an excellent take-off point for planned industrial effluent requirements.

"Obtain data on trends in water quality and on progress being made by industry to meet target dates for the construction of abatement facilities."

It is important to note that the water quality monitoring mission is two-fold. The Pollution Control agencies of the Federal and State levels are concerned with specific surveillance of waste sources and effectiveness of pollution control measures of the point of origin while the Geological Survey's concern is with establishing bench-mark quality (natural condition) and continuing surveillance of change in quality of the resource as an indication of the net effect of nature and man. There is no conflict with or duplication of these monitoring efforts, in fact formal working agreements have been concluded regarding the division of these responsibilities. To achieve the objective of the General Accounting Office report, it is important that the proper emphasis be placed on both principal aspects of the monitoring requirements--i.e., monitoring of municipal, industrial and other waste discharges and the continuing surveillance of the quality of the water resource. Accordingly, we recommend that the General Accounting Office report focus more directly on the problem in such a way as to extend its suggestions to the Congress to include emphasis on the desirability to upgrade the National Water Data Network as an integral part of improving the data source.

"Provide additional guidance to FWQA Regional personnel on enforcement procedures."

While enforcement procedures are uniquely specified in the Act, guidance is provided to Regional personnel through regular contact by the FWQA Headquarters' staff, through wide distribution of verbatim transcripts of enforcement proceedings. Practical guidance is also provided through designation of Regional personnel to participate in and to conduct selected proceedings. Practical guidance is also provided through the required submission of a checklist to accompany Regional recommendations for the initiation of enforcement proceedings.

Again we must take issue with the General Accounting Office recommendation to Congress in support of less than secondary waste treatment. The key element in the State/Federal nationwide program to abate existing pollution and prevent pollution where it has not already occurred is the requirement for the "best practicable treatment" which is usually defined as a minimum of secondary treatment.

We submit the following for further consideration to support the Department's position:

The treatment projects are designed to meet 20 years projected requirements, i.e. a 1970 project is designed for 1990 waste loading. However, the water quality standards are based upon present determinations and represent goals believed obtainable in the more immediate future. The uncertainty of what the 1990 demands of any region will actually be, dictates that projects be designed for the best obtainable treatment possible.

The draft report, in Chapter 2, page 9 and following, shows how inadequate plants have caused a backlog of waste treatment facility requirements because of poor plant construction in the past. This trend must be reversed.

On page 39 the draft report assumes that the "assimilative capacity of the waterway" formula for designing waste treatment facilities is an exact science. Unfortunately this is not the fact. The quality of water is made more perfect depending upon the amount of waste kept out of it.

On page 40 the draft report refers to the legal opinion of the Solicitor's Office stating: "Insofar as the Secretary determines that secondary treatment is necessary to achieve the criteria of water quality adopted by a State, and approved by him, he may require such secondary treatment in a State's plan of implementation and enforcement of its water quality standards."

Furthermore, with regard to Section 8(c) grants, which are in question here, since they are discretionary, the Secretary has authority to require minimum levels of treatment as a condition for the award of the construction grants. The Solicitor's opinion dated December 4, 1969, states: "In our opinion, the Secretary has authority to require minimum levels of treatment as a condition for the award of construction grants." (copy attached), and is directly contrary to the statement made on page 54, "...even though an Associate Solicitor of the Department of the Interior has ruled that the agency cannot legally impose such a requirement."

We appreciate the opportunity to comment on the draft report.

Sincerely yours,

J. J. Wall Jr.

Director of Survey and Review

Enclosure

State Water Quality Control Board
47 Trinity Avenue, S. W.
Atlanta, Georgia 30334

August 7, 1970

Mr. Allen R. Voss
Associate Director
U.S. General Accounting Office
Civil Division
Washington, D. C. 20548

Dear Mr. Voss:

We appreciate the draft copy of the G.A.O. report on "Industrial Water Pollution - Progress and Problems." We are pleased to recommend and comment as follows.

We recommend that the report point out strongly the importance (the efficiency and economy that could result) of avoiding repetitive and duplicative operations and administrative services by the state and federal agencies. The efforts of the state and the federal agencies should be concentrated and directed towards those matters or functions in which each can perform most effectively in a practical sense.

The practical, down-to-earth work of reviewing plans, installation of sewerage facilities, standards enforcement, monitoring and surveillance of streams and sewerage facilities should be state responsibilities, primarily. The direct intrusion of FWQA into these areas frustrates state efforts and creates confusion and duplication.

On the other hand, there are many technical questions that are of national importance that the federal agency should apply itself. There are many toxic elements and compounds that need to be studied, especially in regard to their direct and indirect effects on animals and man and their synergistic relationships to other pollutants and aquatic organisms.

The current concern about mercury in our waterways and in marine life is an example. The states can enforce control of mercury discharges once they are located. The federal agency has the means to de-

termine what industries use mercury, locating them, and supplying such information promptly to the states. The federal agencies should be able to establish guidelines for mercury discharges, provide information on symptoms of mercury poisoning, natural background levels of mercury in water, soils and animals.

The federal agency, we think, should evaluate sewerage equipment (pumps, aerators, etc), develop specifications and new methods for waste treatment through practical research. Really the area for federal usefulness is unlimited but it should lie in the direction, principally, of policy guidance, technical assistance and development of useful technical information.

Overall, we feel you have done a very good job on the report and commend you for its thoroughness.

Sincerely,

R. S. Howard, Jr.
Executive Secretary

RSH:aj

STATE OF MAINE
ENVIRONMENTAL IMPROVEMENT COMMISSION
AUGUSTA, MAINE 04330

September 3, 1970

Allen R. Voss
Associate Director
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Voss:

In response to your letter of July 31, 1970 and commenting upon the draft of the Report to the Congress of the United States on Industrial Water Pollution - Progress and Problems, the following comments are made:

a. Most important are factors omitted, but having to do with federal action, applicable to municipalities but reflecting directly upon industry as well.

1. Lack of Federal Aide Funding
2. Continued changing of statute kept communities holding back for more advantageous program.
3. Many especially small coastal communities hold back because of 85% B.O.D. requirement

b. Paragraph 2 Page 14 brings to mind that many factors besides water pollution control were involved in the change sulphite to craft pulping-such as use of hardwoods.

c. Paragraph 2 Page 35. This statement generally applied does not appear to make sense.

d. Paragraph 2 Page 52. With conditions in the streams established as in need of upgrading at time of classification and with no appreciable changes there appears to be no need of repeating surveys.

Very truly yours.

William R Adams 2nd

William R. Adams
Director
Environmental Improvement Commission

WRA/dc

APPENDIX V

NATURAL RESOURCES COMMISSION
F. M. LAITALA
Chairman
CARL T. JOHNSON
ROBERT C. McLAUGHLIN
AUGUST SCHOLLE
HARRY H. WHITELEY

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

RALPH A. MACMULLAN, Director

WATER RESOURCES COMMISSION
JOHN E. VOGT
Chairman
STANLEY QUACKENBUSH
Vice Chairman
GERALD E. EDDY
JOHN P. WOODFORD
JIM GILMORE
GEORGE F. LIDDLE
JOHN H. KITCHEL, M.D.

September 15, 1970

Mr. Allen R. Voss
Associate Director
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Voss:

In regard to your proposed report to the Congress on the progress and problems in controlling industrial pollution, we wish to inform you that we have reviewed those portions of the report having reference to the Michigan pollution program and found them to be in accordance with the information submitted to your field men.

Very truly yours,

WATER RESOURCES COMMISSION

F. B. Frost
Chief Engineer

FBF:ms

MICHIGAN
THE GREAT LAKE STATE

APPENDIX VI

JAMES A. RHODES, Governor

EMMETT W. ARNOLD, M.D.
Director of Health

450 East Town Street
P.O. Box 118
Columbus, Ohio 43216

State of Ohio

Department of Health

PUBLIC HEALTH COUNCIL
J. Howard Holmes, M.D.
Chairman
Ralph K. Ramsayer, M.D.
Vice Chairman
J. F. Mear, Ph.G.
Phillip T. Knies, M.D.
Lloyd E. Larrick, M.D.
J. Bruce Wenger, D.V.M.
Richard V. Brunner, D.D.S.

August 18, 1970

Mr. Allen R. Voss, Associate Director
United States General Accounting Office
441 G Street, N.W.
Washington, D. C. 20548

Dear Mr. Voss:

Following are the comments of the Ohio Department of Health on the draft copy of your report "Industrial Water Pollution - Progress and Problems" enclosed with your letter of July 31, to Dr. E. W. Arnold, Chairman, Ohio Water Pollution Control Board.

The cost figures given on page 12 are at least 50% low in our opinion. While it is recognized that reliable figures are not available, the use of partial figures could be very misleading.

The sentence on page 32 which states "Although some water quality data is being received from the United States Geological Survey, municipalities and independent contractors, the data is not being analyzed to show whether there is a reduction or increase in water quality" should be revised to state "The water quality data being received from the United States Geological Survey under contract with Ohio and from independent contractors, municipalities and industries is not being analyzed regularly to show whether there is a reduction or increase in water pollution".

The sentence on page 32 which states "Companies which have waste treatment facilities are not submitting effluent reports to the State agency on a regular basis and, in many cases, the reports that are submitted do not contain adequate information concerning waste characteristics" should be revised to state "Some companies which have waste treatment facilities are not submitting effluent reports to the State agency on a regular basis and further, in some cases, the reports that are submitted do not contain adequate information concerning waste characteristics".

Otherwise, we find the Ohio portion of the report to be factual and to the point. You are to be commended for it.

Sincerely,

George H. Eagle
Chief Engineer

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

DANIEL J. EVANS
GOVERNOR

JOHN A. BIGGS
DIRECTOR

August 29, 1970

Mr. Allen R. Voss
Associate Director
Civil Division
United States General Accounting Office
Washington D.C. 20548

Re: Report to the Congress of the United States
on Industrial Water Pollution - Progress and
Problems - Federal Water Quality Administration
Department of Interior

Dear Mr. Voss:

This letter will serve as this agency's comments on the subject report draft submitted by you for our review. We would like to express our appreciation for the opportunity to make comments on this report and also we would like to request a copy of the final publication. Our copy of the report draft is being returned for your records.

Before making any general comments, I would like to correct the figure on the last line of Page 12. This company has recently provided us with revised cost estimates which increase this number to $52.7 million from the $35 million shown. All the other figures shown in the report concerning this state appear to be correct.

With respect to the general body of the report, there are a number of items which deserve comment. In numerous locations throughout the report, the point is stressed that, "the states have the primary responsibility for preventing and controlling water pollution." This state agrees whole heartedly with this philosophy. However, the general tone of the report, which is backed up by your final recommendation, is that the federal government should be stepping into the enforcement picture and taking the "primary responsibility" away from the states.

Further, throughout the report, the "problem areas" are identified as:

1. The state's capability to control pollution through financing, staffing and monitoring.

2. Planning through waste inventories, effects of pollutants, and treatment requirements.

3. The federal enforcement authority, activity and guidelines.

Nowhere in the report do you discuss what the state's activities are in the enforcement area. Neither do you discuss what can be done at the federal level to assist the states in their enforcement activities. If your original philosophy that it is the state's responsibility to control pollution is to be carried to its logical end, then there should be a section added covering what the states are now doing and what they need to do a better job of enforcement. This state has substantially increased its enforcement activities over the past eighteen months, and we feel we are in a very good position with respect to capabilities, planning and enforcement activities.

A second item of concern to this agency is the position GAO has taken that only that degree of treatment is necessary which will maintain a receiving water at the level of purity defined by the standards. Our state statutes, adopted in 1945, requires that all dischargers are to provide all known available and reasonable methods of waste treatment before discharge to a state waterway. Secondly, the water quality standards, adopted by this state and approved by the Secretary of the Interior, contain a "nondegradation" clause which simply states that the existing water quality, if higher than that of the standards, will be the governing quality and is not to be allowed to be lessened below the existing levels of purity. Your recommended approach of requiring the minimum degree of treatment commensurate with the standards is not in agreement with this state's philosophy. Although the report recommends minimum treatment requirements it does not provide any justification for why this recommendation was promulgated nor does it show by its data gathered from the states that this is the best approach. To simply state this premise is not enough justification for its adoption.

Finally, the report states that GAO recommends the adoption of effluent standards because, among other things, effluent standards are easier to enforce. The authority to set effluent standards within this state has been clearly defined by legislative action. This agency has been writing effluent requirements into its waste discharge permits for the past fifteen years. For this reason, we do not feel it is necessary to adopt effluent standards on a broad scale since we are able to apply them in each individual case. From the data presented in the report, it does not seem justified to recommend national effluent standards.

In summary, then, the information contained within the attached report appears technically correct. Many of the conclusions and recommendations, however, do not appear justified or the most logical based upon the data presented with the report.

Again, thank you for the opportunity to review and comment on this report. Please contact us should you have any questions concerning our comments.

Very truly yours,

JOHN A. BIGGS
Director

JAMES P. BEHLKE
Assistant Director

JPB:lg

cc: Mr. Leonard Dowd

APPENDIX VIII

PRINCIPAL OFFICIALS

OF THE DEPARTMENT OF THE INTERIOR

RESPONSIBLE FOR ADMINISTRATION OF THE ACTIVITIES

DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
SECRETARY OF THE INTERIOR:		
Walter J. Hickel	Feb. 1969	Present
Stewart L. Udall	Jan. 1961	Jan. 1969
ASSISTANT SECRETARY FOR WATER QUALITY AND RESEARCH (note a):		
Vacant	Oct. 1970	Present
Carl L. Klein	Mar. 1969	Oct. 1970
Max N. Edwards	Dec. 1967	Feb. 1969
Frank C. Di Luzio	July 1966	Dec. 1967
COMMISSIONER, FEDERAL WATER QUALITY ADMINISTRATION (note b):		
David D. Dominick	Mar. 1969	Present
Joe G. Moore, Jr.	Feb. 1968	Mar. 1969
James M. Quigley	Mar. 1966	Jan. 1968

[a]Designated as Assistant Secretary for Water Pollution Control until October 1968.

[b]The Federal Water Quality Administration was transferred from the Department of Health, Education, and Welfare in May 1966.

U.S. GAO Wash., D.C.